

Rec'd PCT/PTO 08 SEP 2004

(19) World Intellectual Property Organization  
International Bureau



10/506980

(43) International Publication Date  
18 September 2003 (18.09.2003)

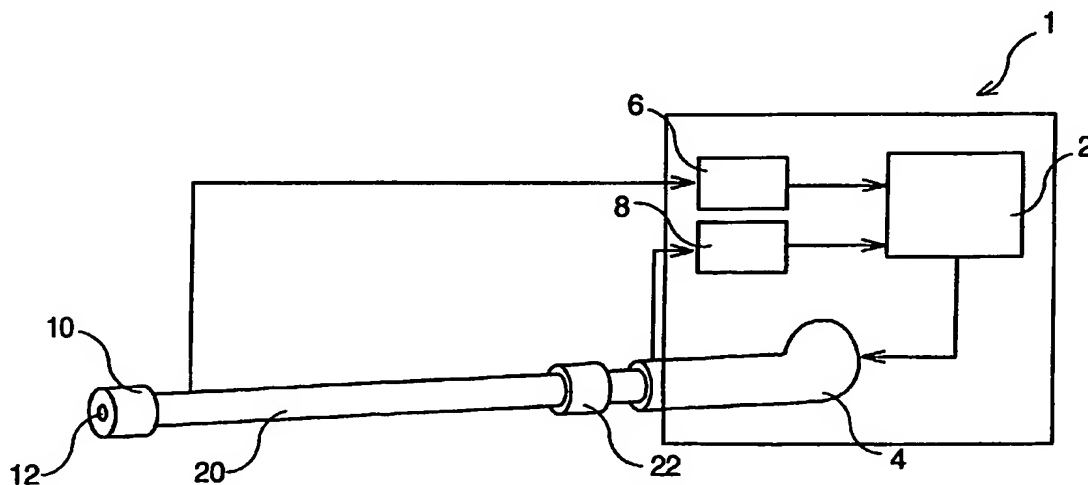
PCT

(10) International Publication Number  
WO 03/075990 A3

- (51) International Patent Classification<sup>7</sup>: A61M 16/00 (74) Agent: BONNEAU, Gerard; Cabinet Bonneau, Les Tais-sounières HB3, 1681, route des Dolines, F-06560 Sophia Antipolis (FR).
- (21) International Application Number: PCT/IB03/01403
- (22) International Filing Date: 10 March 2003 (10.03.2003) (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 60/362,441 8 March 2002 (08.03.2002) US (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- (72) Inventors; and (75) Inventors/Applicants (*for US only*): DELACHE, Alain [FR/FR]; 15, avenue de la Roseraie, F-06300 Nice (FR). DELACHE, Véronique [FR/FR]; 15, avenue de la Roseraie, F-06300 Nice (FR).
- Published:  
— with international search report

[Continued on next page]

(54) Title: A BREATHING APPARATUS WITH COMPUTATION OF THE AIRFLOW PROVIDED TO THE PATIENT USING ONLY PRESSURE SENSORS



(57) Abstract: The invention concerns an apparatus (1) to assist patient respiration by delivering air to a patient through a mask, said mask being designed to be connected on one first extremity of a tube (20), said apparatus (1) comprising, a) a control unit (2) to adjust the pressure delivered by the blower (4) of said apparatus (1), b) a first pressure sensor (6) for sensing the pressure PM at said first tube extremity and being connected to said control unit (2), and c) a second pressure sensor (8) for sensing the pressure PB at the air output of said blower (4) and being connected to said control unit (2); in order that, when a tube (20) is connected to said mask and connected to said apparatus (1) on its said second extremity, the air flowing from the apparatus (1) to the mask, said control unit (2) is able to calculate the airflow at said, second extremity of the tube (20) from said pressures PM and PB and from the airflow resistance coefficient  $K_r$  of said tube (20).

WO 03/075990 A3



— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**(88) Date of publication of the international search report:**  
27 November 2003

## INTERNATIONAL SEARCH REPORT

Internat Application No  
PCT/ 03/01403A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 A61M16/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 A61M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 177 810 A (SAIME SARL) 6 February 2002 (2002-02-06) paragraph '0044! - paragraph '0045!; figure 2 ---	1,2
A	EP 1 166 813 A (SIEMENS ELEMA AB) 2 January 2002 (2002-01-02) abstract; figures ---	1-19
A	EP 0 821 976 A (SIEMENS ELEMA AB) 4 February 1998 (1998-02-04) abstract; figures ---	1-19
A	WO 98 57691 A (MARTIN DION CHARLES CHEWE ;RESMED LTD (AU); KENYON BARTON JOHN (AU) 23 December 1998 (1998-12-23) abstract; figures ---	1-19
	--- -/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the International filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the International filing date but later than the priority date claimed

- \*T\* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*G\* document member of the same patent family

Date of the actual completion of the international search

3 September 2003

Date of mailing of the international search report

01/10/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Valfort, C

## INTERNATIONAL SEARCH REPORT

Internat Application No  
PCT/ 03/01403

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 92 11054 A (PURITAN BENNETT CORP) 9 July 1992 (1992-07-09) abstract; figures ---	1-19
P,X	WO 02 053217 A (WICKHAM NICOLA FRANCES EF ; RESMED LTD (AU)) 11 July 2002 (2002-07-11)	1-4
A	page 11, line 1 - line 5 page 16, line 5 - page 17, line 20 page 18, line 5 - page 19, line 14; figures 1-3 -----	5-19

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International

Application No

PCT/

93/01403

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1177810	A	06-02-2002	FR 2812203 A1 EP 1177810 A1 JP 2002119595 A US 2002014239 A1	01-02-2002 06-02-2002 23-04-2002 07-02-2002
EP 1166813	A	02-01-2002	EP 1166813 A2 JP 2002143309 A US 2002020410 A1	02-01-2002 21-05-2002 21-02-2002
EP 0821976	A	04-02-1998	EP 0821976 A1 JP 10071205 A US 5878744 A	04-02-1998 17-03-1998 09-03-1999
WO 9857691	A	23-12-1998	AU 745216 B2 AU 7197898 A AU 7898998 A WO 9857691 A1 EP 0989875 A1 JP 2002503998 T US 6397841 B1	14-03-2002 24-12-1998 04-01-1999 23-12-1998 05-04-2000 05-02-2002 04-06-2002
WO 9211054	A	09-07-1992	US 5134995 A AT 190230 T AU 686034 B2 AU 4071195 A AU 6371798 A AU 663054 B2 AU 8215491 A CA 2097502 A1 CA 2206784 A1 DE 69132030 D1 DE 69132030 T2 DK 563044 T3 EP 0563044 A1 EP 0968734 A2 ES 2145739 T3 JP 2927958 B2 JP 6503484 T WO 9211054 A1 US 5549106 A US 5794614 A US 5845636 A US 5259373 A	04-08-1992 15-03-2000 29-01-1998 18-04-1996 30-07-1998 28-09-1995 22-07-1992 22-06-1992 22-06-1992 13-04-2000 19-10-2000 14-08-2000 06-10-1993 05-01-2000 16-07-2000 28-07-1999 21-04-1994 09-07-1992 27-08-1996 18-08-1998 08-12-1998 09-11-1993
WO 02053217	A	11-07-2002	WO 02053217 A1	11-07-2002